PHENIX

TECHNICAL SUPPORT 2012

PHENIX WEEKLY PLANNING

6/21/2012

Don Lynch

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TECHNICAL SUPPORT 2012

This Week

- Cu-Au Run continues
- No Maintenance access this week
- VTX/FVTX Chiller Repairs
- CAD Shutdown Activities ESRC Review
- sPHENIX design and analysis continues
- 2012 Shutdown prep continues
- End of Run Party tomorrow, noon

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Next Week

- Cu-Au Run ends, short 5 GeV run
- Next access Monday June 25 to open VTX (3 hrs)
- Run 12 ends 8 AM June 27
- VTX/FVTX continue testing until 7/9
- Purge flammable gas
- Open shield wall
- Begin shutdown activities
- sPHENIX design and analysis continues
- 2012 Shutdown prep continues
- Other Business

TECHNICAL SUPPORT 2012

2012 Shutdown Projects:

- VTX/FVTX Removal, Repair and Upgrade, Reinstallation
- VTX/FVTX cooling system maintenance and upgrades
- RPC1 Cooling Upgrade
- DC West Repairs/Upgrade
- MuTr Station 1 South Upgrade
- MuTr, MuTrigger Stations 2 & 3 Upgrades
- MPC repairs
- Other subsystem work
- Future Upgrades related work

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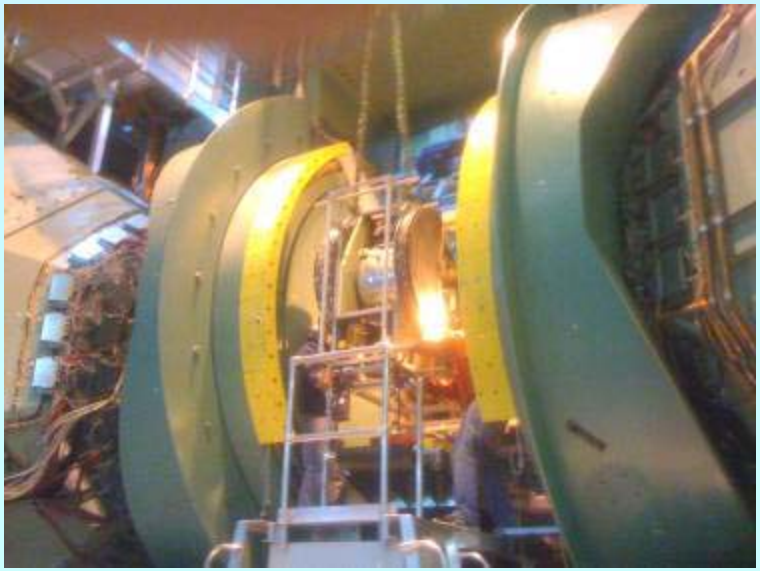
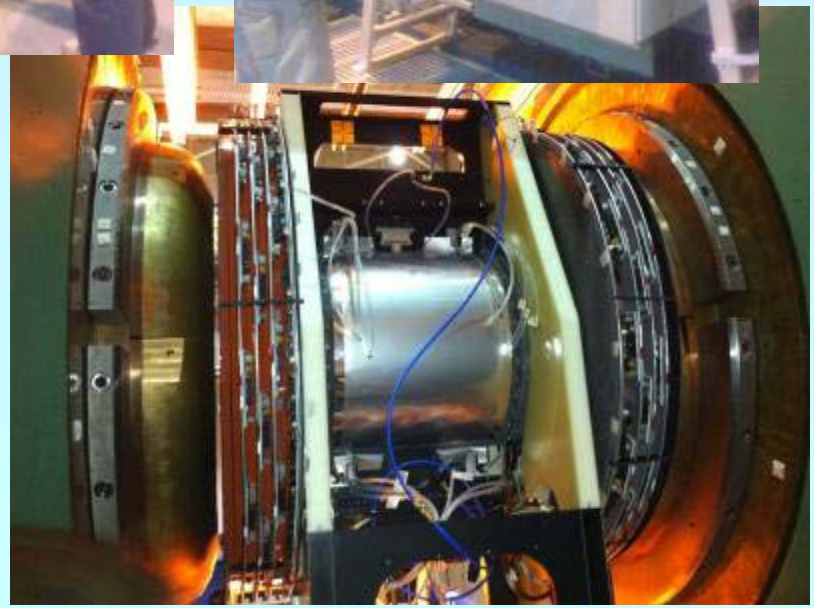
VTX Installation 2010 & 2011. 2012 Removal and re-installation will be same.





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VTX & FVTX Summary of Tasks

VTX/FVTX Disassembly – After Start of shutdown tasks are completed (EC out to AH), coolant and N_2 lines, LV, signal and HV cables and fibers will be carefully removed and coolant drained. East and west detector halves will then be de-mounted and transported to Chemistry bldg for maintenance and overhaul.

At Chemistry lab – VTX, bigwheels and FVTX will be disassembled and all 4 FVTX stations will be transported to the FVTX PHYSICS Lab.

At PHYSICS FVTX lab –FVTX stations will be tested, faults will be isolated, repaired and re-tested.

Concurrently at Chemistry lab –VTX will be disassembled into individual barrels and bigwheels, defective electronics will be removed and replaced with new or repaired electronics. The VTX will then be re-assembled tested and re-surveyed.

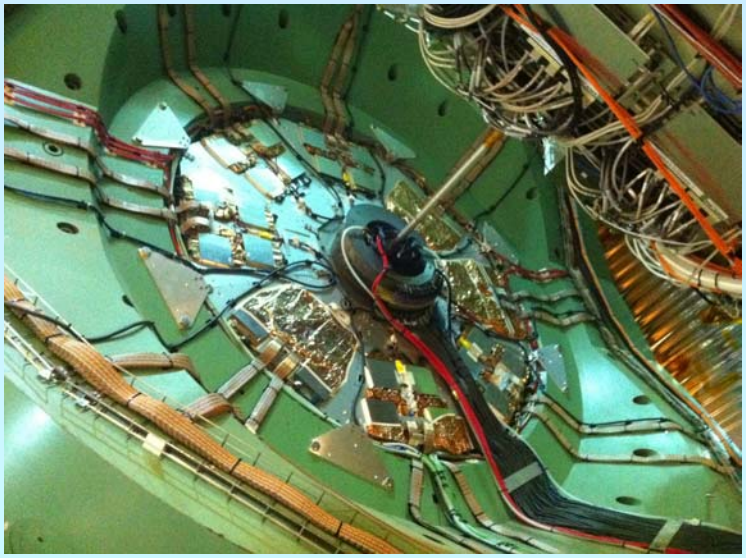
FVTX transported to Chemistry building. FVTX Integrated into VTX. VTX/FVTX assembly surveyed

VTX&FVTX assembly transported to PHENIX and installed on rails.

Coolant and N_2 lines, LV, signal and HV cables and fibers will be carefully reattached.

Full detector re-surveyed in IR

RPC Station 1 North and South Cooling Upgrade



North

South

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RPC Station 1 North and South Cooling Upgrade

During run 12, we had a single blower/flexible hose crudely positioned to blow air across the faces of the RPC1's. In spite of this, the results were acceptable and we were able to operate the RPC1's without experiencing any significant thermal problems.

It is desired, however, to add some margin for error (partial AC failure, blower failure, flow distribution non-uniformity, etc.) to improve the reliability of the cooling system.

This summer we will add 2 more blowers, one each for the north and south, and refine the flexible hose positioning to optimize air flow across the individual detector subsystem octants.

Flow will be directed inward and upward from approximately 4:30 and 7:30 on both the north and the south side.

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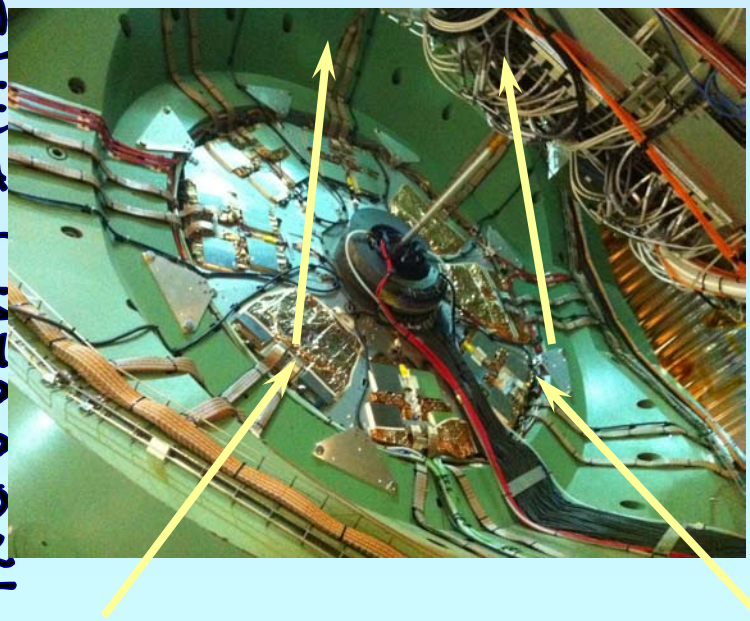
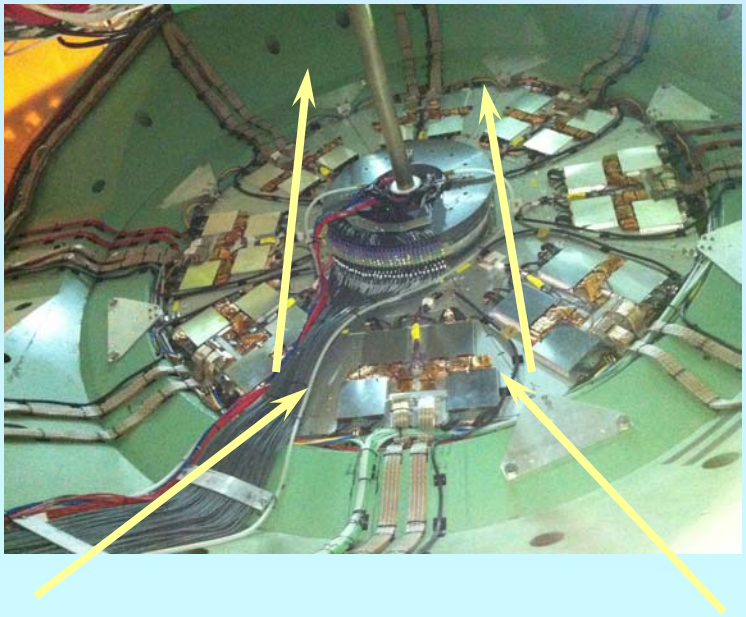
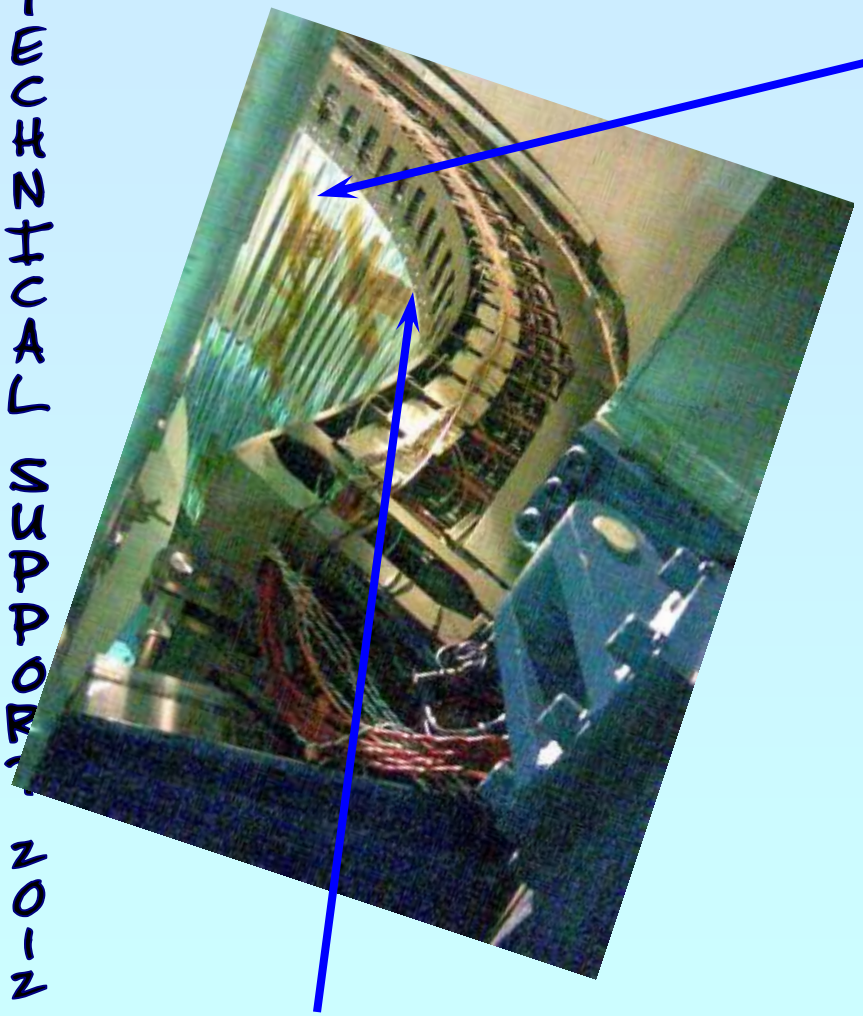




Approximate Air flow paths for the North and South RPC1's

DC West Repairs/Upgrade



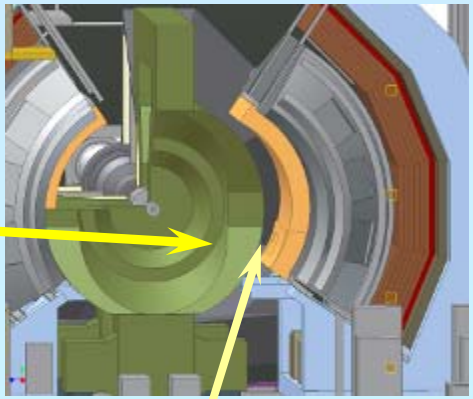
Years of wire repairs on the DC west have rendered the DC west window a patchwork of tape and have elevated leak rates to the point where replacement of the mylar window is needed. The design of the DC west window is slightly different from the DC east which has an improved window support structure and sealing concept. These improvements are to be incorporated into the DC West this summer.

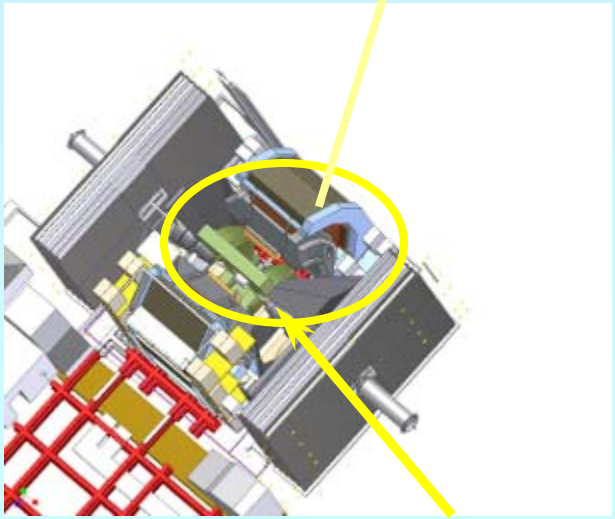
Sealing/window mounting plates (both sides)

DC West Repairs/Upgrade

The plan for the DC West Repairs is as follows:

Need to design, fabricate and assemble a work platform between the CM and the DC West





- Gather drawings and materials from DC group
- Make measurements, new drawings and create parts lists as necessary
- Procure/fabricate parts
- Design work platforms and protective covering to access and protect DC west during disassembly/ reassembly. CAD review.
- Disassemble existing window and sealing components
- Repair/remove broken wires, etc.
- Install new window and seal.
- Leak and functional tests

Need to cover this area to prevent debris from entering the DC cavity while window is removed

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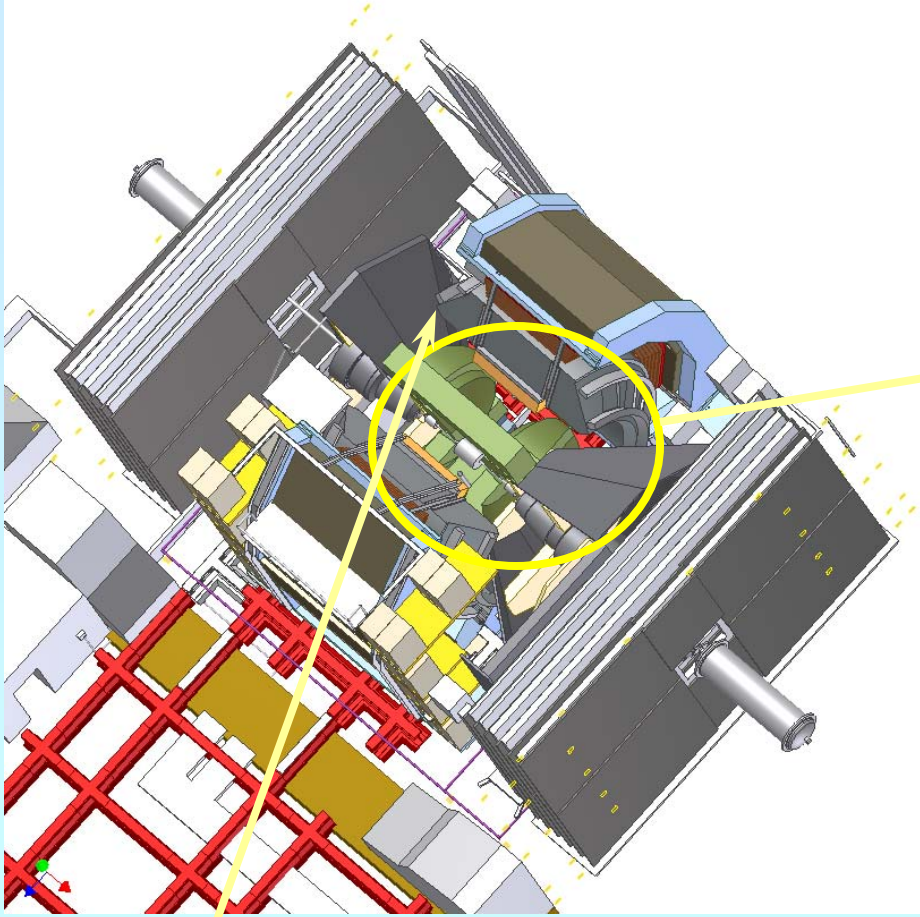
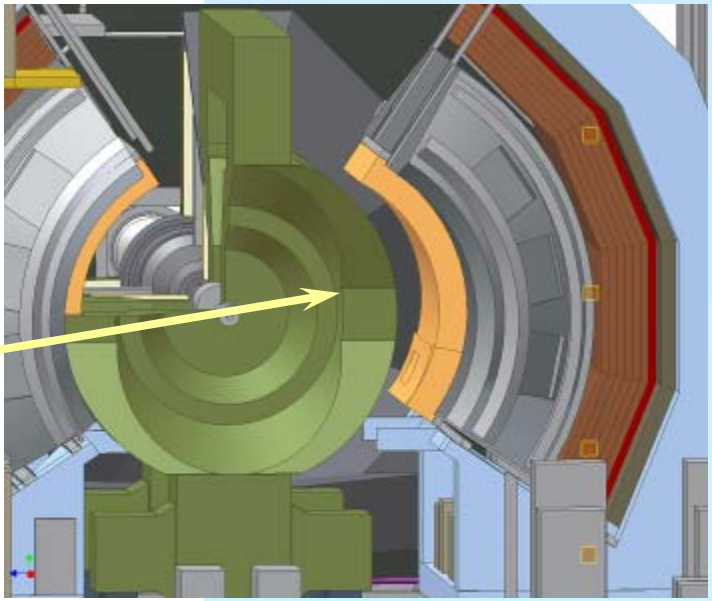




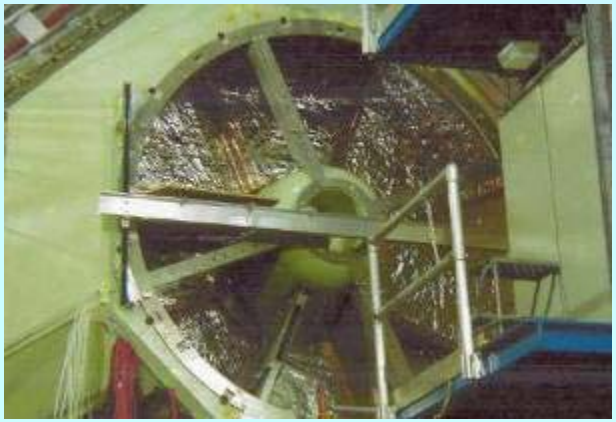
Need to design, fabricate and assemble a work platform between the CM and the DC West

Need to cover this area to prevent debris from entering the DC cavity while window is removed

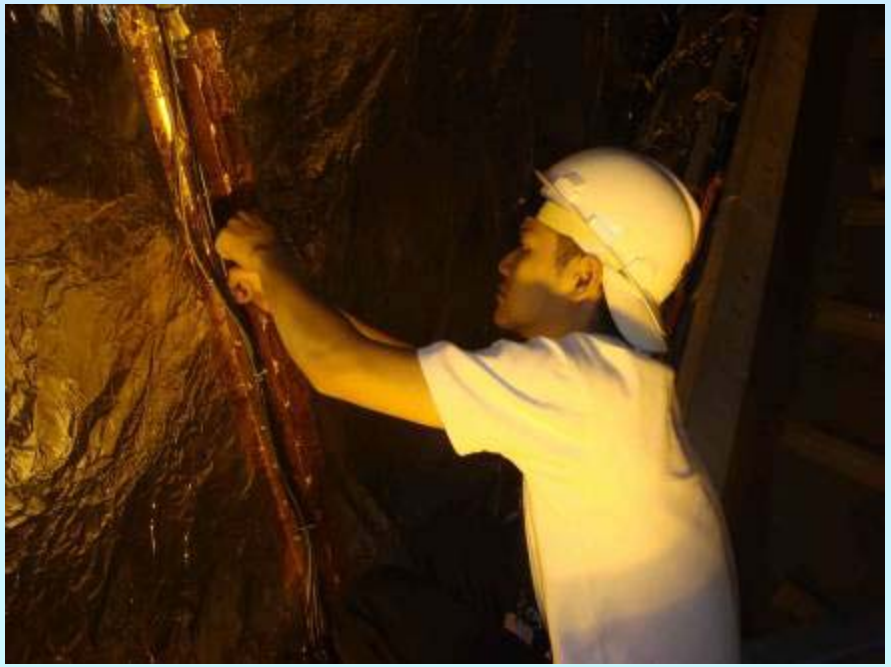
- Station-1 South re-capacitation and termination

vacuum lifting fixture

view when sta-1 removed (south)



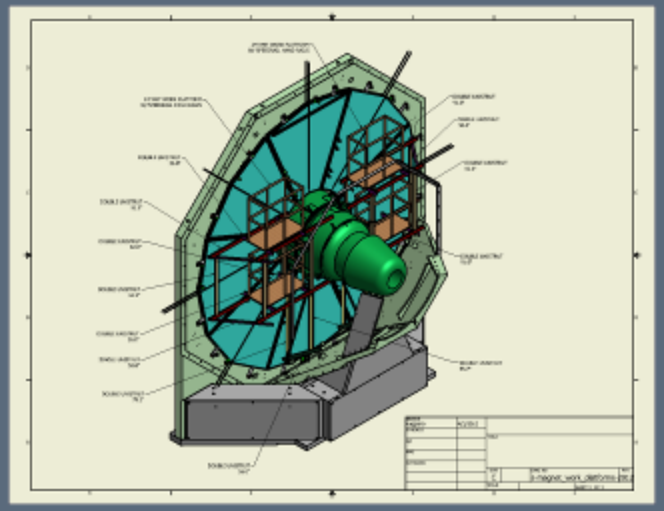
Station-3 Clamp Installation

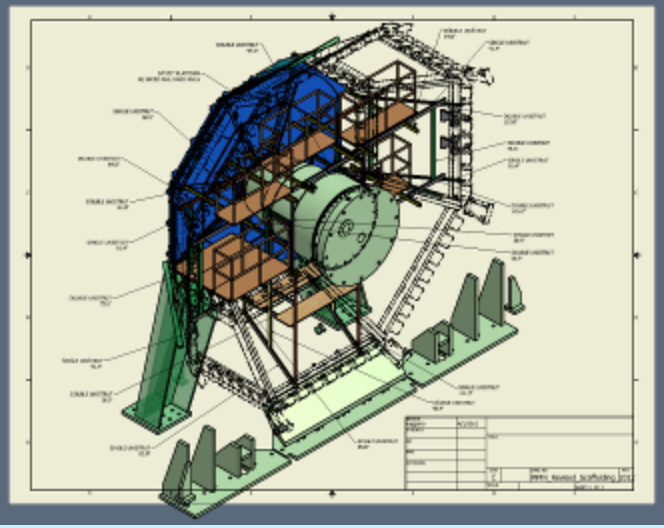


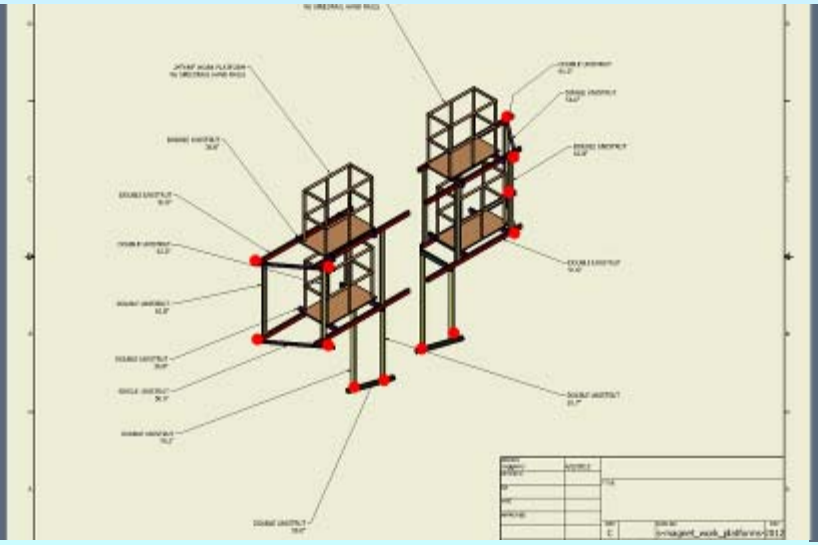
- Anode card Inspection with mirror : < 5min/clamp.
- Anode clean up if necessary : < 15 min./clamp
- Clamp mount : ~ 5min./clamp
- Voltage readout : 5min./clamp
- HV test : 10min.
- Total : 25 ~ 40 min./clamp

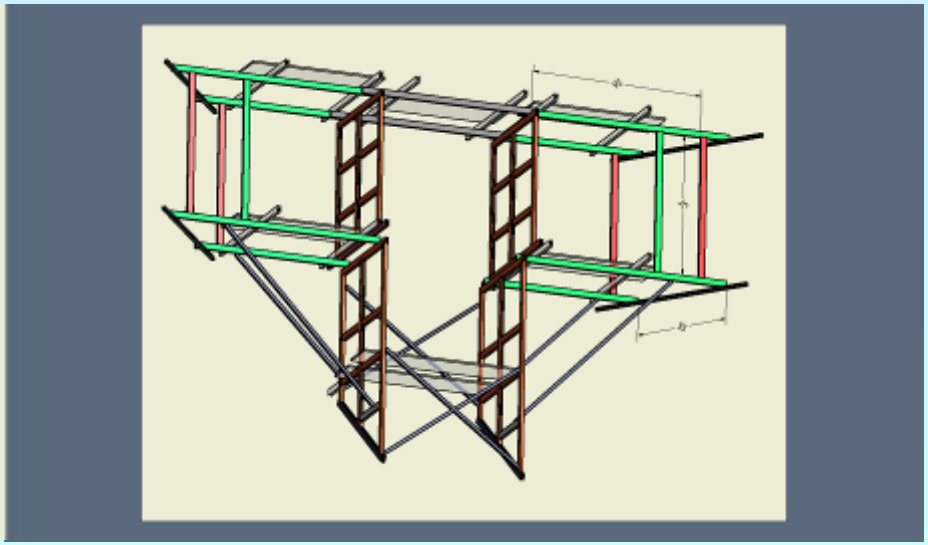
Clamp-on Terminator Installation on North & South Station-3

- Lower clamp-on terminators already installed for both north and south sta-3 (bottom 4 octants)
- With new work platforms that reaches all of sta-3; install remaining (upper) clamp-on terminators.
- Analyses submitted to CAD engineering.







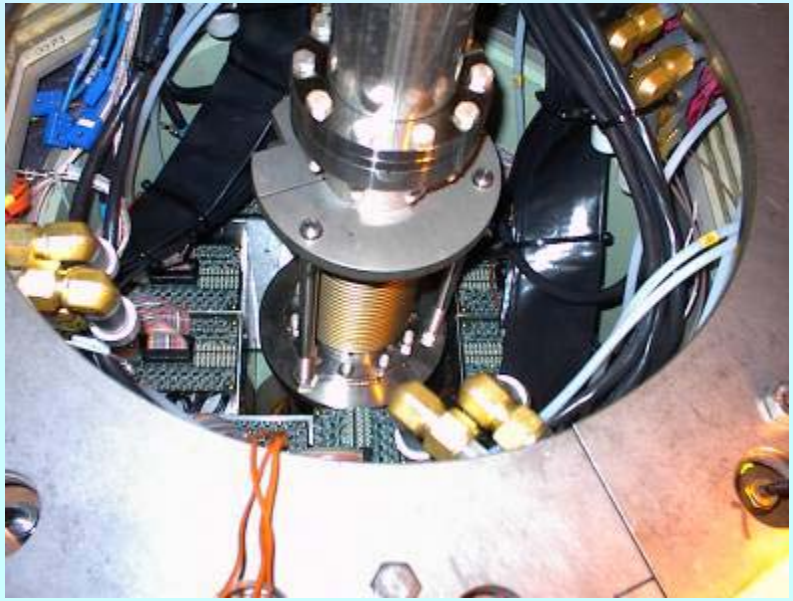


MMS Work Platforms

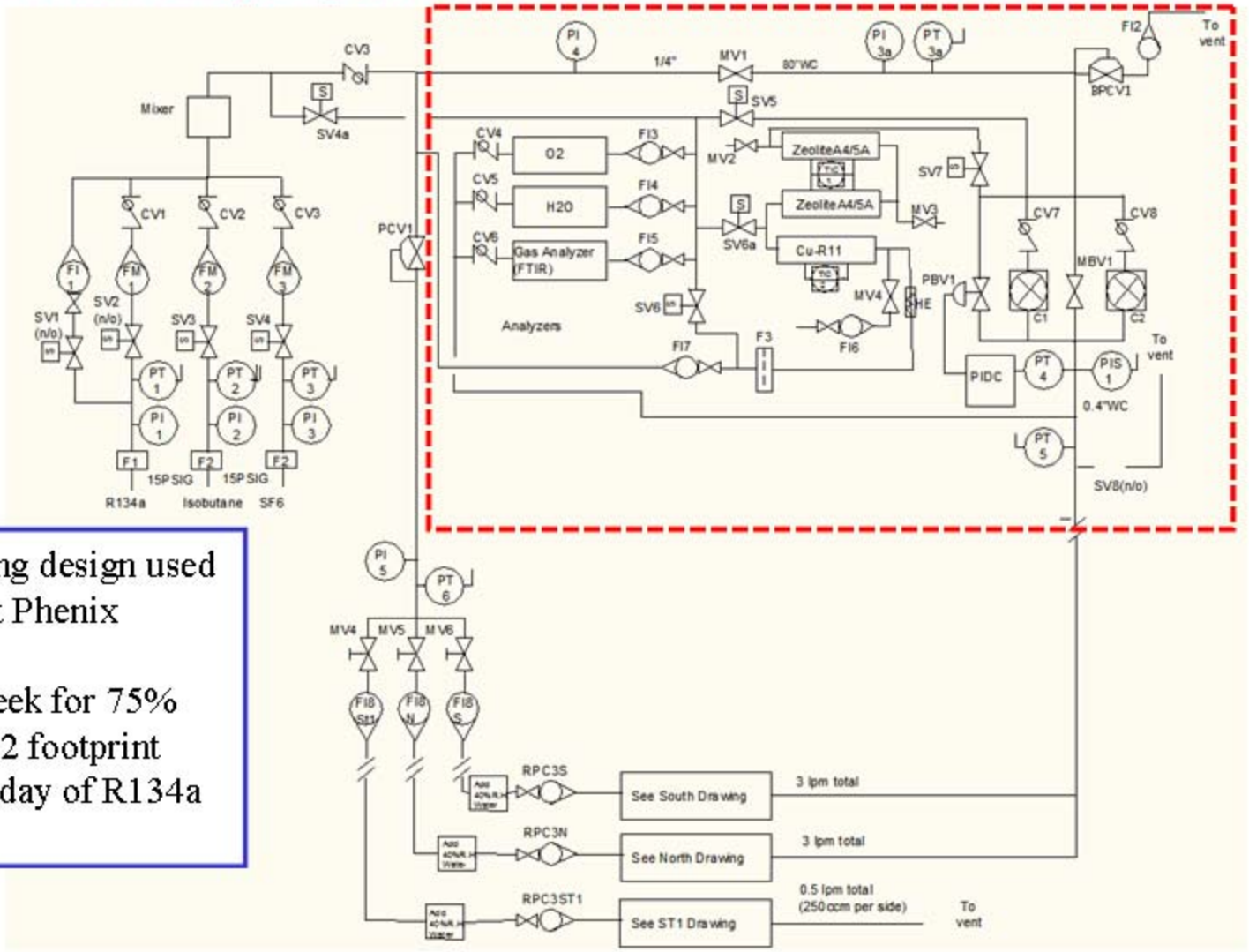
MMN Work Platforms

MPC repairs

During run 12 both the north and south MPC internal electronics experienced a damaging event that disabled a large fraction of the MPC modules. MPC experts have determined that the damaged components can not be repaired in situ. Consequently the MPC modules must be removed and repaired in the PHENIX electronics shop and/or at an external vendor. Additional steps are anticipated to provide protection against similar future events.



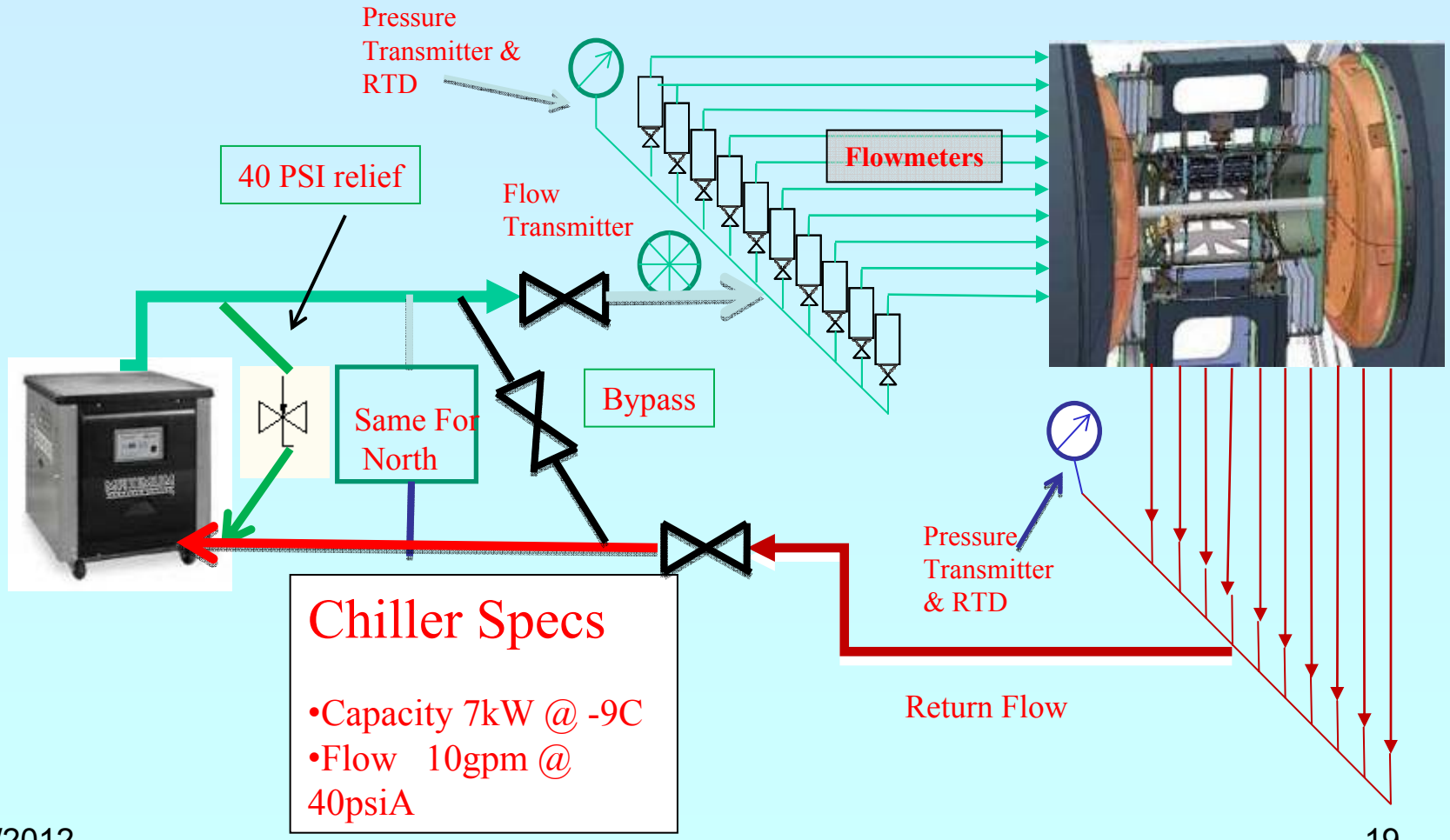
Recirculating Upgrade to RPC Gas System



- Based on working design used for many years at Phenix
- Save money
  - $3k per week for 75%
- Reduces lab CO2 footprint
  - 60 lbs per day of R134a

Nover 7200 Chiller

- Big Wheel/ Low temp chiller
  - Rebuild to increase size of manifold
  - make pixel lines permanent
- Low Temp
  - Split North FVTX feeds
  - Upgrade to ¾" pipe from ½" where possible
  - Increase size of manifold to reduce restrictions
- Nitrogen
  - Add more lines for FVTX feeds



Chiller Specs

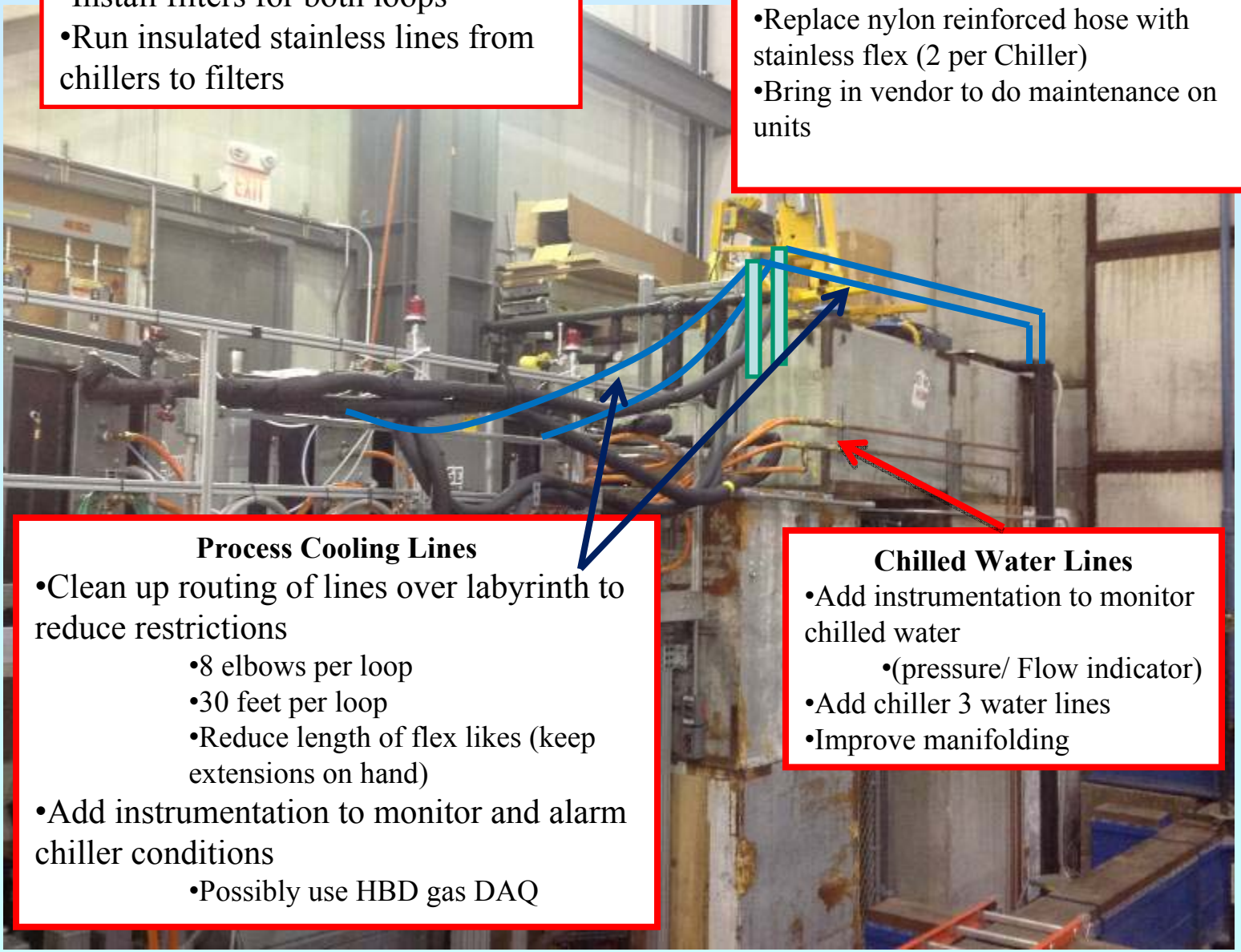
- Capacity 7kW @ -9C
- Flow 10gpm @ 40psiA

Upgrade Novec Cleaning System

- Install filters for both loops
- Run insulated stainless lines from chillers to filters

Chiller Work

- Replace nylon reinforced hose with stainless flex (2 per Chiller)
- Bring in vendor to do maintenance on units



Process Cooling Lines

- Clean up routing of lines over labyrinth to reduce restrictions
  - 8 elbows per loop
  - 30 feet per loop
  - Reduce length of flex likes (keep extensions on hand)
- Add instrumentation to monitor and alarm chiller conditions
  - Possibly use HBD gas DAQ

Chilled Water Lines

- Add instrumentation to monitor chilled water
  - (pressure/ Flow indicator)
- Add chiller 3 water lines
- Improve manifolding

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New Electrical Work for 2012 Shutdown, to be accomplished as time is available

1. Support CAD replacement of Assembly Hall 480V Fused Switch Panels #8H-1, 8H-2, and 8 EMH1. Coordinate temporary power patch while work is being performed and minimize impact on shutdown work.
2. Add the Assembly Hall Crane lockout/contactor/ indicator light key switch circuit – similar to IR Crane.
3. Add Transient Surge Suppressor to 3 phase power panel on the Central Magnet Bridge.
4. The Gas Mixing House Breaker Panel for the Gas Mixing side is almost out of spare breaker slots and needs to be reviewed for increased capacity panel to replace it.
5. New computer rack replacements/additions for upcoming Run 13 & Rack Room computer infrastructure changes involving power distribution circuit (UPS and normal AC power) re-work

Additional Work for 2012, not yet scheduled, to be fit in as available

1. Replaced aging magnet hoses (CM only)
2. identify obsolete services passing through sill and remove them.
3. Cover for services coming from IR through sill.
4. Plan for stripping out TEC electronics and services to free up TEC racks.
5. Add limit switch and improved spooling control for window washer cable.

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TECHNICAL SUPPORT 2012

PHENIX Shutdown 2012 Electronics Upgrade /Repair

- Replace remaining RS-485 type ADAMs on West carriage with MODBUS/TCP type.
- Install Ethernet switches and MODBUS/TCP ADAMs on Central Magnet arm.
- Install second MODBUS server in counting house.
- Install MTP patch bay and jumpers for FVTX in counting house.
- Add several backup MTP fibers from CH to IR

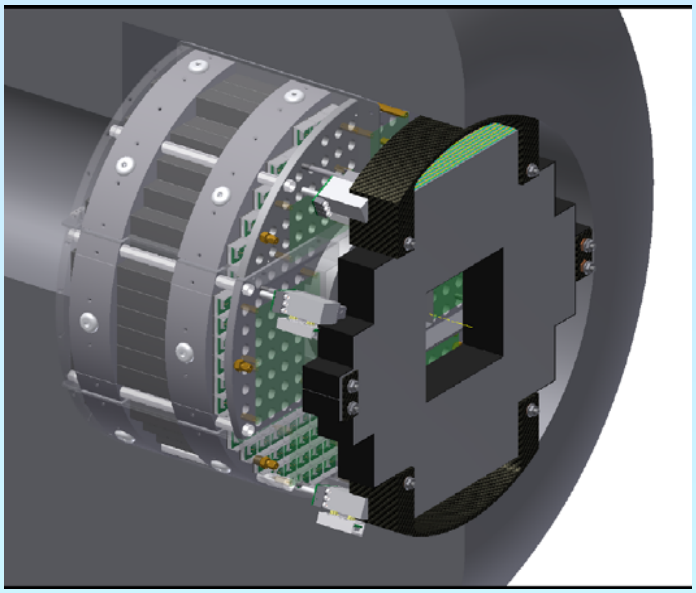
Other Work for 2012, not yet scheduled, to be fit in as available

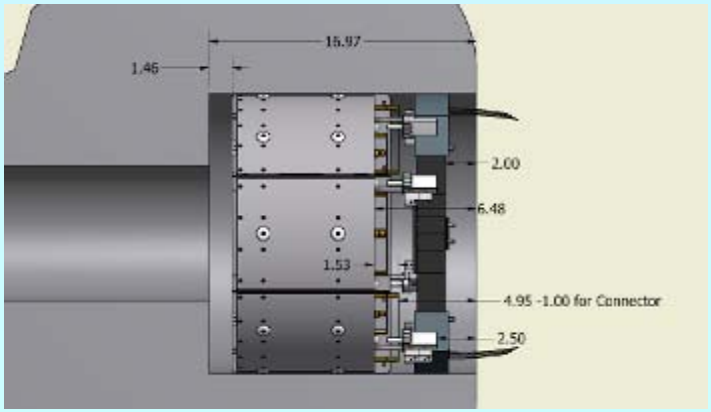
- Replace aging magnet hoses (CM only)
- identify obsolete services passing through sill and remove them.
- Cover for services coming from IR through sill.
- Plan for stripping out TEC electronics and services to free up TEC racks.
- Add limit switch and improved spooling control for window washer cable.

TECHNICAL SUPPORT 2012

MPC-Ex Upgrade

We will be making measurements and test fitting mockups this summer in preparation for design and fabrication next fall, if proposed upgrade is approved





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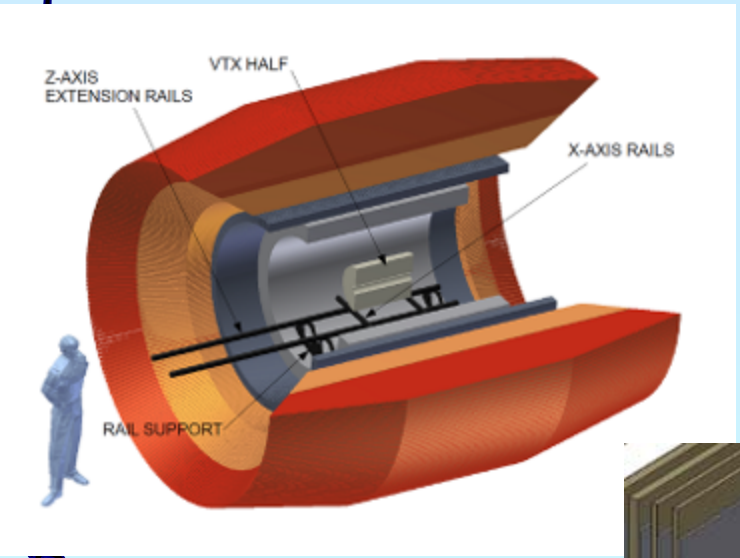

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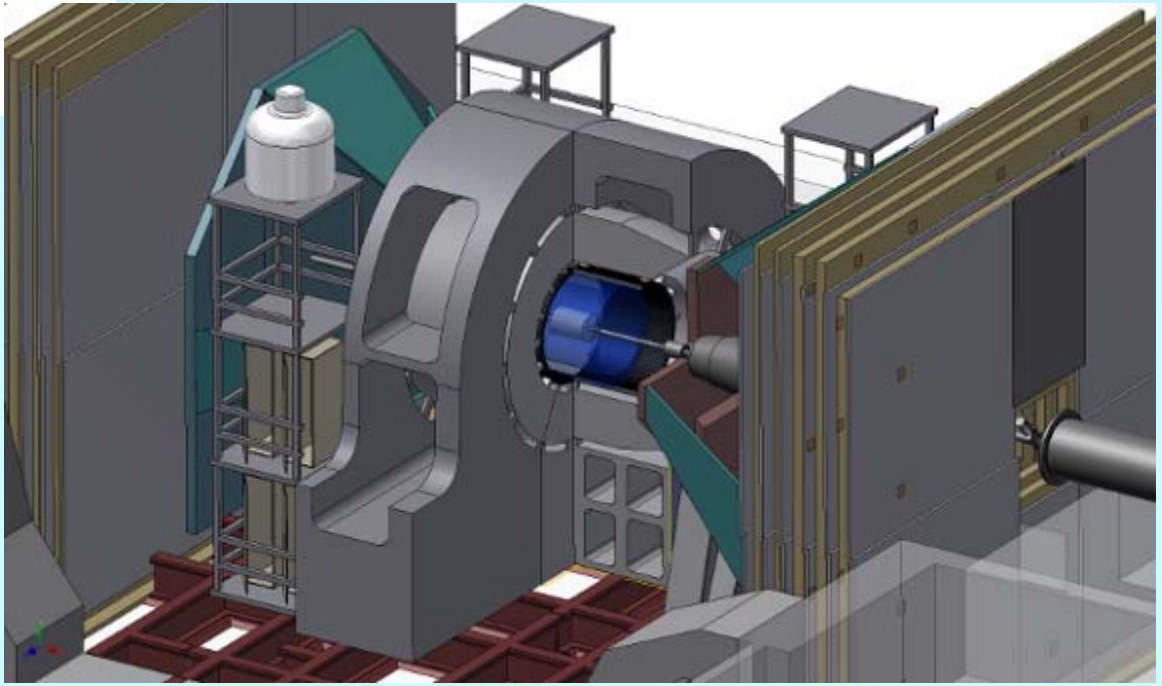
sPHENIX Proposed Upgrade

We will be making measurements and observations to develop information concerning decommissioning and removal of some existing PHENIX subsystems, and integration of sPHENIX into retained PHENIX subsystems.



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TECHNICAL SUPPORT 2012

Requested CAD Support for 2012 Shutdown

Riggers – Disassemble and stow moveable shield wall and plug door - week of June 25

Riggers and Carpenters – remove dumbwaiter and ladder from EC - week of July 2

Carpenter – Assist with Station 1, MMS, MMN and DC West scaffolding and work platforms - -7/23-Oct. 26 (2 weeks at beginning 1 week at end, ½ days at various intervals between)

Articulated manlift – For removal and re-installation of MPC N - weeks of 7/9 and 10/16

CAD Mech techs – remove and restore MMS and MMN lampshades – week of 7/23

Survey – VTX/FVTX at Chemistry and PHENIX IR - 10/8-11/9

Riggers – transport VTX/FVTX to IR from Chemistry - week of 10/29

Carpenters and Riggers – erect and disassemble Summer Sunday dance floor - 8/1-8/7

Riggers and Carpenters – restore dumbwaiter and ladder to EC - week of 11/26

Riggers – Assemble shield wall and Install plug door – 12/26-12/28

Blue Sheets and White Sheets - 12/3-12/21

A/C evaluation and repairs, IR and rack room A/C's – complete by start of run 13

Procedures for Shutdown 2012

- Existing PHENIX General Purpose Recurring Task procedures
- VTX Removal
- FVTX/VTX installation
- VTX Survey
- FVTX Survey
- FVTX Cooling SystemUpgrades
- MuTr Maintenance & Upgrade (stations 1 2 & 3)
- MuTrigger Maintenance and Upgrade
- DC Repair – Incl. in WP
- MPC removal and re-installation – incl in WP

Procedures will be part of 1 WP for VTX and FVTX

Incl. in separate WP's for MMN and MMS entry

Work Permits for Shutdown 2012

- Start of Shutdown (PHENIX)
- VTX Removal/FVTX/VTX Installation
- MuTr/MuTrigger Maintenance and Upgrade 3 WP's: Station 1, MMN and MMS work
- RPC1 Cooling Upgrade (PHENIX)
- DC West Repairs
- MPC repairs
- End of Shutdown (PHENIX)

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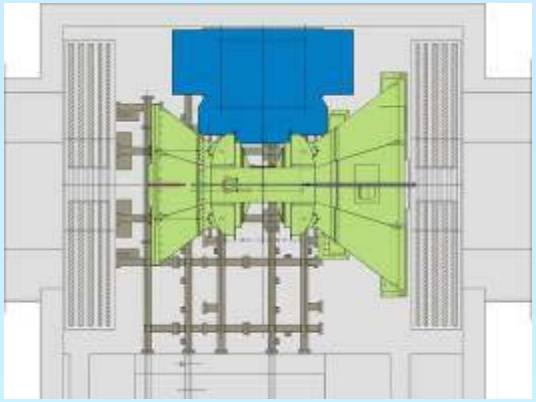
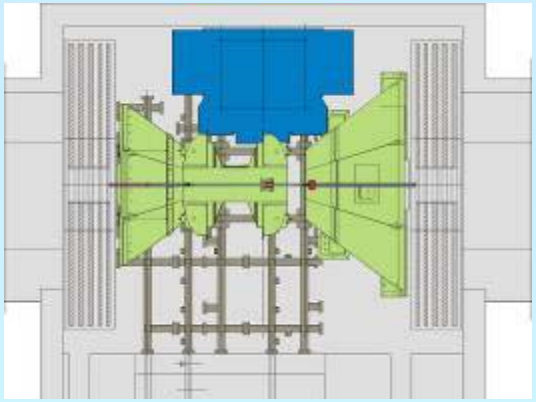
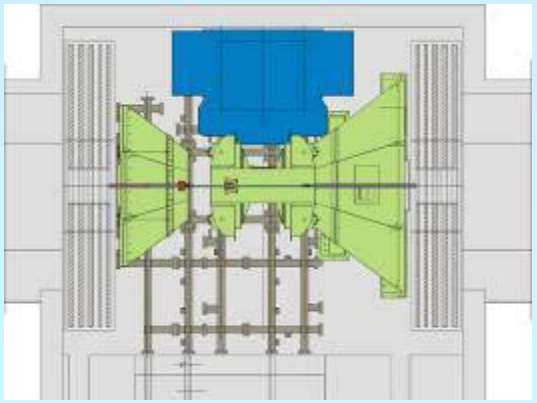
TECHNICAL SUPPORT 2012



IR is currently in this (Run) configuration. (MuID collars not shown)



After MuID collars are removed and EC is moved to AH, MMS is moved south. CM is then moved south to gain access to Station 1 North. MPC North to be removed, RPC1 North to be addressed. (1 week)



CM is then moved north to gain access to station 1 south. Work on RPC1 South, DC West, MPC South and MuTr Station 1 South. After all work finishred move CM south, reinstall MPC complete RPC1 North work, survey step 1 for beampipe, then move CM north complete beampipe and CM survey. Move MMS North to run position. VTX/FVTX work may be done in any configuration.

2012 Shutdown Schedule

TECHNICAL SUPPORT 2012

Prep for shutdown	2/1-6/25/2011
Define tasks and goals	
Analysis and design of fixtures, tools and procedures	
Fabricate/procure tools and fixtures	
Tests, mockups, prototypes	
Receive, fabricate, modify, finish installables	
Review and approval of parts, tools, fixtures and procedures	
Assembly and QA tests	
AH Crane Upgrade (variable speed & wireless remote)	
End of Run Party	6/22/2012
Run 12 Ends	6/27/2012
Shutdown Standard Tasks	6/27-7/20/2012
• Open wall, disassemble wall, Remove MuID Collars,	
• Move EC to AH, etc.	
VTX Strip-pixel post run tests	6/27-6/30/2012
FVTX post run tests	7/1-7/8/2012
Disassemble VTX/FVTX services	7/9-7/27/2012
July 4th Holiday	7/4/2012
Open Station 1 North, remove MPC North for repairs	7/9-13/2012
RPC1 North Cooling Upgrade	7/9-13/2012
Remove VTX/FVTX and transport to Chemistry Lab	7/30/2012
Remove MMS & MMN vertical East lampshades	7/23-7/27/2012
Summer Sunday (8/5) Prep and teardown	8/1-8/7/2012
Summer Sunday (RHIC)	8/5/12

2012 Shutdown Schedule (Continued)

TECHNICAL SUPPORT 2012

MuTr South Station 1 work	
Install access (Sta. 1work platforms)	7/30-8/3/2012
Disconnect Cables, hoses etc, ID/label all	8/6-8/10/2012
Remove FEE plates and chambers	8/13-8/17/2012
Station 2 Terminators and manifold upgrade through access opened by station 1 removal	8/20/-8/31/2012
MPC South repairs	8/20-9/15/2012
RPC 1 South cooling upgrade	8/20-9/15/2012
Labor Day Holiday	9/3/2012
MuTr South Station 1 work (Cont'd)	
Clean/install new MuTr Sta. 1 chamber parts and upgrades (concurrent At RPC Factory)	8/20/-9/7/2012
Re-install chambers and FEE plates	9/10-9/14/2012
Re-cable, re-hose and test	9/10-9/28/2012
re-capacitation and air manifold upgrades	
Station 3 North and South (upper half)	7/23-9/30/2012
Repair upgrade, reassemble VTX/FVTX	7/23-10/5/2012
Test, survey (at Chemistry and IR) and re-install VTX/FVTX	10/8-11/9/2012
Substation breaker upgrade/test (CAD)	8/20-9/30
AH utility power distribution upgrade	8/20-9/30
DC West maintenance (replace window)	9/15-10/15
RPC stations 1 and 3, north and south maintenance	As required
Other detector maintenance as required	As required
Infrastructure maintenance as required	As required
TBD prototype tasks	As required
Open Station 1 North, re-install MPC North	10/16-10/26/2012
RPC1 North Cooling upgrade (if not completed earlier)	10/16-10/26/2012

2012 Shutdown Schedule (Continued)

TECHNICAL SUPPORT 2012

Veterans Day Holiday	11/12/201212
Pre-run commissioning and prep for run 13	11/1-12/31/2012
Prep for EC roll in	11/12-11/16/2012
Roll in EC	11/19-11/23/2012
Thanksgiving Holidays	11/22-23/2012
Prep IR for run	11/26-12/3/2010
Pink/Blue/White sheets	12/3-12/21/201
Christmas Holidays	12/24-25/2012
Start run 13	1/1/2013

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TECHNICAL SUPPORT 2012

1. Configuration Management – New Procedures in progress.
2. Site-wide ISO 14001 & OHSAS 18001 Registration Audit, this week Anyone interviewed?
3. PHENIX Shutdown review with CAD ESRC Yesterday, no problems

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TECHNICAL SUPPORT 2012

From George Goode ALD for ESH

Biking Safety

Recently we've had several incidents involving unsafe bicycle usage onsite. These events include:

- Bikers swerving suddenly in the path of oncoming vehicles,
- Students wearing headphones in both ears while biking,
- Students riding on sidewalks,
- Employees biking with their helmet attached to the bike, and not on their heads.

As our site-wide fleet distribution has significantly decreased, many of us are seeking other modes of transportation, such as biking and walking. In addition, we have an increased presence of pedestrians and bikers during the summer months. Please reinforce again basic biking safety guidelines with your staff—both as drivers and bikers. Everyone plays a role in this scenario.

Safety makes science possible at Brookhaven National Laboratory

Why Is It Important to Be Safe While Biking?

Each year in the United States, about 800 people die in bicycle-related accidents. The key aspects of avoiding accidents while biking are: ***be predictable and protect yourself.***

Be Predictable

Make it easy for motorists and other cyclists to tell what you are going to do. Cyclists are required to obey the same rules as drivers. Failure to obey these rules is a major contributing factor for accidents. In particular, riding the wrong way, ignoring stop signs, running red lights, and failure to observe right-of-way rules for lane changes are major contributing factors in those accidents in which cyclists are injured.

Remember: When riding a bicycle, you will always come out second best in any conflict with a motor vehicle, even if you have the right-of-way!

Protect Yourself

The other key aspect to safe biking is to wear the proper protective gear both on your person and your bicycle. These items include bike helmet, highly visible or reflective outerwear, and proper reflectors on the bike.

Whether you cycle around the site for business or pleasure, all riders are required to follow the BNL bicycle-safety policy which states a bicycle helmet must be worn when cycling at BNL. Also, that helmet must conform to the Consumer Product Safety Commission (CPSC) standard. Helmets meeting the CPSC standard can be ordered from BNL inventory (stock **#K-70310**). For assistance in ordering, contact your Department/Division Environment, Safety and Health (ESH) Coordinator or Administrative Assistant.

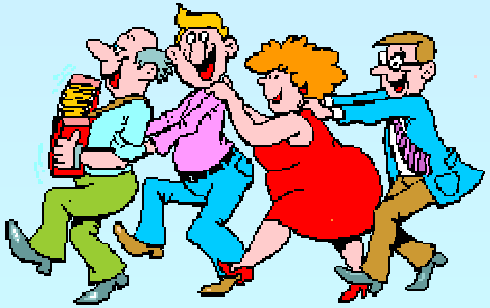
Bicycle Safety Guidelines and Rules

- **Wear** a bicycle helmet. It is NYS law for persons less than 14 years of age and BNL policy for all cyclists on site.
- **Obey** all traffic signals.
- **Do not** ride your bicycle on the sidewalks.
- **Ride** in the same direction as the flow of traffic.
- **Ride** in a straight line and single file.
- **Ride** to the right if you are moving slower than other traffic, unless you are turning left, passing another bicycle or vehicle, or avoiding hazards.
- **Be alert** for road hazards.
- **Watch** for cars at cross streets and driveways.
- **Be aware** of parked cars and watch for car doors that may open.
- **Give** pedestrians the right of way.
- **Use** proper hand signals when turning, stopping, or changing lanes.
- **Do not** wear headphones in both ears while riding.
- **Do not** talk or text on a cell phone while riding.
- **Do not** drink and ride.
- **Use** a light, reflectors and reflective clothing during low-light conditions.
- **Wear** bright clothing during the daytime.
- **Use** extra caution when it is raining, and allow extra time to stop.
- **Keep** your bike properly maintained.

Note: Bicycle helmets are a restricted-inventory item, so you must be authorized by your *ES&H Coordinator* or someone similar to order one through the PeopleSoft pick-ticket system. LED bike lights are also available in stock for BNL-purchased bicycles.

Where To Find PHENIX Engineering Info

PHENIX End of Run Party This Friday Noon – 2 PM at 1008



http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_SSint-page.htm